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COUNTERFORCE, DAMAGE-LIMITING, AND DETERRENCE

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Military force, it would appear, is needed to deter the Soviet Union and other opponents of the United States from acting against our vital national interest; but the ethical concerns and human costs of high levels of violence are so great as to rule out their use. Under these conditions, what happens to deterrence? This dilemma -- the need for us to maintain a threat posture against an opponent perceived as threatening us while seeking to minimize the possible effects of what that opponent might do under extreme circumstances -- structures every issue of national military strategy or policy that comes up for public examination.

What follows is an attempt to clarify the nature of this dilemma, as it stands today, by examining some of the concepts that have dominated strategic thought in recent years. Those who doubt the need for better understanding of these concepts should consider for a moment the current discussion over the deployment of antiballistic

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missiles. Not only is the debate over the ABM deployment decision overshadowed by wrangling over the U.S. role in Vietnam, but the fine arguments and logical considerations of strategy that should go into the decision also tend to be dominated by public hunger for a defense system that will protect some part of the population from the worst imaginable if least likely contingency.

For ease of exposition, the heuristic models and definitions that are offered herein present only the U.S. side of the strategic equation. A two-sided or even a many-sided view of the concepts in application is essential for sophisticated analysis. In fact, one of the questions that regularly presents itself to strategists is the extent to which the opponent is employing the same strategic calculus in arriving at his appraisals of the situation.

A caveat also needs to be entered as to the mixture of theory and reality in the analytical models, and to the intermingling of past, present, and future strategic ideas. Some of these concepts have been overtaken by reality, and future technology will overtake others. The body of strategic thinking is in a state of flux and is radically affected by technological possibilities. Nuclear submarines, for example, may turn out to be vulnerable to new weapons systems, and future strategic missiles could prove more costly and less effective than some future antiballistic missile system. Each development, each advance, changes the strategic calculus. But the intent here is not to present a history of strategic concepts, nor to capture them at some discrete point in time, but rather to facilitate understanding of the basic

concepts that impose upon us the dilemma of creating military power for the purpose of not using it.

When we set out to say something easy to understand about matters of strategy, we encounter the usual disabilities of the simple statement: many subtle considerations are necessarily left out of the account. Although these very subtleties may in fact be the dominant considerations in developing certain strategies, they do not seem essential to understanding the bare bones of deterrence policy. And deterrence policy must be more generally understood if it is to survive emotionally attractive, if logically insupportable, criticisms. Since these criticisms stem in part from inadequate understanding of the terms: strategy, counterforce, countervalue, deterrence, first strike, second strike, and others; it may clear the air to begin with definitions.

Strategy has, until recently, been a word of considerable precision, derived from the Greek words meaning "to lead an army" and universally defined as the science or art of employing the armed force of a belligerent to secure the objects of war. The application of the term "strategy" to games, business, and politics retains the sense of the word but transfers it to nonmilitary activities by analogy. This makes it necessary to speak of "military strategy" where "strategy" alone would once have been enough. It is not without significance that Marshal Sokolovskii entitled his book on Soviet strategy, Military Strategy. His choice highlights the concern that Soviet military thinkers have been expressing recently over what seems to them the loose extension of the word "strategy" into the arena of political warfare.

"Strategy," or rather its derivative, "strategic," is used to make certain distinctions that do not appear under the dictionary definition. First, strategic forces are distinguished from tactical forces, a distinction that existed before the nuclear age to differentiate forces employed to obtain indirect effects -- e.g., destruction of factories -- from those employed to obtain direct effects by destroying enemy forces in the field. Also, strategic forces are distinguished from conventional forces. This is a meaning that has arisen in the nuclear age, or perhaps the air age. Again, strategic forces are now thought of as nuclear forces intended for use somewhere other than the battlefield, which is a special case of the general usage that distinguishes strategic from tactical actions. Then too, by analogy, since strategic considerations are of greater importance than tactical ones, strategic weapons are in the same way more devastating than tactical weapons -- though tactical weapons may be nuclear as well as conventional.

To talk of general war strategy today is to talk of counterforce and countervalue, the two main courses of military action. The strategist can elect to strike at his opponent's military forces. This is counterforce and in the nuclear age people tend to think of it as a single blow against enemy "strategic" nuclear forces. Alternatively, the strategist can undertake to strike at the sources of his opponent's national strength, i.e., his economic resources or population. In the nuclear age this is labeled as countervalue strategy, with derogatory overtones stemming from its history of application in war. The

two strategies are not, of course, mutually exclusive and consideration of both enters into the formulation of national defense strategy.

Much of what is subsumed these days under the rubric of strategy is not strategy at all, at least in the traditional sense. Deterrence, for example, only marginally fits into the traditional usage of the word, although military power is its most essential ingredient. In the "real world" of the defense analysts, which may or may not exist in fact, the word "strategy" appears to include policies, capabilities, political maneuvers, and the entire range of actions -- including military actions -- by which one state or alliance of states seeks to gain advantage over another. Among these, deterrence compels the most attention, for it is the main policy by which we have sought to avoid the occurrence of nuclear war.

To deter is to dissuade someone from undertaking an action through fear of the consequences. Deterrence works in large part through psychological effect although decision-makers, as apart from publics, may be even more sensitive to damage calculations or calculations of risk. Churchill's phrase, "the balance of terror," strongly suggests the political role of fear in deterrence, and it may be, as Herman Kahn notes in On Thermonuclear War, "after all, a psychological phenomenon."* Though deterrence is perhaps physically immeasurable, it is nonetheless real, and we

* Herman Kahn, On Thermonuclear War, Princeton, New Jersey, 1960, Preface, p. ix. Kahn's view is, of course, a layman's view. Decision-makers and psychologists might take issue with him on this point, respectively for reasons of experience or psychological expertise.

can make rational statements and calculations about it to supplement the risk calculations of the strategists.

Deterrence is not only psychological in effect, but also defensive in nature, for it seeks to inhibit an opponent from aggression. This is not to say that the role of deterrence is negative. After all, the prevention of war is a positive achievement, even though the policy relies on, as Glenn Snyder says, "the negative aspect of political power...the power to dissuade as opposed to the power to coerce or compel."* But perhaps the nature of deterrence is best understood through the uses to which it is put. For example, the United States has not consciously sought, through its deterrence policy, to weaken relationships within the Soviet Bloc, although, as Herbert Dinerstein points out, the growing Sino-Soviet sense of security from unprovoked attack was a necessary precondition for their sharp differences to emerge.** More consciously, the deterring threat has been used to maintain the U.S. and Allied position in Berlin, and, in a notable instance more positively, to block the Soviet acquisition of a strategic missile position in Cuba. This would suggest that, on our side at least, deterrence is to a certain extent linked to the international status quo.

If the opponent seeks to change the status quo, the broadest range of deterrent effects is obtained from the

* Glenn Snyder, Deterrence and Defense, Princeton, New Jersey, 1961, p. 9.

** Herbert S. Dinerstein, Sino-Soviet Conflict in the Underdeveloped Countries, The RAND Corporation, P-2857, January 1964, published in Problems of Communism, March-April 1964.

threat to strike the first strategic blow. To be able to do so requires a first strike capability -- the means, by striking first, to strip the enemy of his ability to hurt us mortally in retaliation. But the contribution of this capability to the psychological process of deterrence depends crucially upon the credibility of our threat to strike under certain conditions. The essential questions here are: Does the enemy believe we will use it, and does he believe it will hurt him intolerably if we do? Alternatively, does the opponent consider it plausible that we will act militarily under specified circumstances; does he consider that our military response is likely to take place; and does he consider that we are willing to incur the ethical and human costs of so doing?

While the strength of our first strike capability obviously forms the basis of credibility, and therefore of effective deterrence, the latter depends in the first instance on the enemy's beliefs, on his image of how we will react in various circumstances, and also on his own capabilities. Some lack of clarity or ambiguity in defining the conditions under which we will act adds a strong element of uncertainty to the opponent's calculations. Thus, factors other than physical capability enter into the credibility and hence the efficacy of our deterrent threat. In sum, however, if the enemy believes our first strike would hurt him grievously and if he believes that we have the will to use it to protect our vital interests, he will be deterred from a wide range of aggressive actions, excepting perhaps the most important of all -- nuclear attack.

If the opponent can build a comparable first strike capability and we have only a first strike option, he may be tempted to go first himself, and we will be faced with a situation that brings to mind Thomas C. Schelling's analogy of the Western style "shoot out."* Within Schelling's analogy, easy distinctions can be made among preventive, surprise, and preemptive attacks. Preventive is when the town marshal shoots down the outlaw on the grounds that he is up to no good. Surprise is when one of them shoots the other when his back is turned. And preemptive is when one of them beats the other to the draw.

To maintain a deterrence posture in the face of an enemy who has a capability himself to initiate preventive, surprise, or preemptive attack, we are forced to create a second strike capability. This is a capability defined in terms of vulnerability. These are weapons systems that can survive an opponent's first strike in sufficient strength to impose losses upon him too painful for him to risk. These weapons systems of low vulnerability are considered to be "secure."

Forces that can wait for the other side to go first can also, a fortiori, go first themselves. But the effectiveness of second strike forces when used in a first strike may be limited by their design. A second strike force designed for punitive, countercity operations -- with rugged but low accuracy missiles carrying small warheads -- might be entirely inadequate to the task of

*Thomas C. Schelling, The Strategy of Conflict, Cambridge, Massachusetts, Harvard University Press, 1960, p. 232.

knocking out the enemy's strategic forces in a counter-force mission. The perfect second strike force, of course, would be able to perform both missions.

Given our possession of relatively secure, second strike forces, considerations of "intra-war" deterrence come into play. This concept suggests that a large portion of one's least vulnerable forces should be withheld from any strike in order to deter an enemy from retaliating. One could then, it is said, launch a limited first strike that would deter the enemy from counterattacking by blunting his capability to retaliate while at the same time holding in reserve enough secure forces to make his retaliation suicidal. Intra-war deterrence, sometimes referred to as "intra-war" coercion, may be characterized as "splendid" theory. It suffers, however, from attributing to the opponent a rationality that in the event might not exist, which may not distinguish it from other theories.

An important distinction is to be made between the opportunities available to the first and to the second striker. Either side's first strike, unless irrational, is more likely to be a counterforce one, if only to limit the damage the defender can impose on the attacker in retaliation. But in the retaliatory or second strike, the striking force may find itself with few counterforce targets or may have difficulty in differentiating between targets that are worth shooting at and those that are not.

Vacant missile pads, empty missile silos, and air bases from which most of the aircraft have been deployed may offer little return for the expenditure of nuclear weapons. Some strategic gleanings could result from counterforce strikes at these targets, for there would always

be some missiles that failed to leave the pad, some missile bases that were setting up to fire a second wave of missiles, some aircraft that were unable to take off, and most importantly, that portion of the enemy's forces that he might have deliberately withheld from his initial strike for purposes of coercion or bargaining. The latter would tend to be his least vulnerable weapons, and while important targets, they would prove hard to destroy. This suggests that second strike retaliation may have to be punitive or be withheld for coercive purposes. Much depends upon the precision of the weapons available. One of the main cases made for manned aircraft is the precision and flexibility that they would bring to the second strike counterforce task.

The primary function of the second strike capability, then, is to deter enemy surprise, preventive, or preemptive strategic attack. Its secondary effect is to lessen the necessity for us to launch our own first strike, unless we see some absolute necessity for doing so. The ideal deterrent force, in this postulation, and leaving aside the question of the relative costs of the two capabilities, is one in which all weapons systems have a first and second strike capability. Except for theoretical purposes, however, the relative costs of the two capabilities cannot be set aside. The missions of the two forces required may differ and an almost invulnerable second strike force might prove less than adequately effective in a first strike role.

In this frame of reference, it will be seen that problems of counterforce and of damage-limiting bear a close relationship to each other. Counterforce is damage-limiting by offensive action, but damage-limitation can

also result from defensive measures. A successful counterforce strike would obviously limit the damage that an enemy could inflict upon us. It would also contribute to victory in the event of war. Both these benefits result from chopping away at the enemy's offensive forces and possibly his will to use them.

When we turn to the defensive side of the strategic calculation, it is equally apparent that actions that reduce U.S. vulnerability will also limit the damage the enemy can inflict upon us (or its effects). These include building blast and fallout shelters in residential and industrial areas, stockpiling of nuclear disaster supplies, recuperation planning, antiaircraft defenses, and the development of population warning and alert systems, as well as the development of antiballistic missile systems. All measures that enhance our capacity for survival or recovery by preparing our society against a very unattractive possibility are defensive damage-limiting.

Thus, the term 'damage-limiting' is usefully confined to describing those actions or, better yet, those capabilities, offensive or defensive, that seek to reduce the damage an opponent can inflict upon us. This reserves the term "damage avoidance"* for those strategies, weapons systems, and warheads by which we would seek to minimize the damage that we would have to inflict upon an enemy in the course of a military operation. A damage avoiding attack requires the use of precise, small warheads, and missiles of great accuracy to knock out the opponent's

* Herman Kahn, Thinking About the Unthinkable, New York 1962, p. 67. The word "avoidance" is used in connection with a closely controlled counterforce strategy.

weapons with the least practicable hurt to the opponent's people or economy. A perfect damage avoidance weapon -- unfortunately not yet in sight -- would destroy enemy weapons without harming even their troops. This would leave the opponent without the means to retaliate, while holding the opponent subject to the coercive influence of such weapons as we would withhold from our counterforce strike.

To illustrate the damage-limiting possibilities of counterforce action, Figure 1 provides a hypothetical curve relating enemy warheads of equal but unspecified explosive power to U.S. population losses.

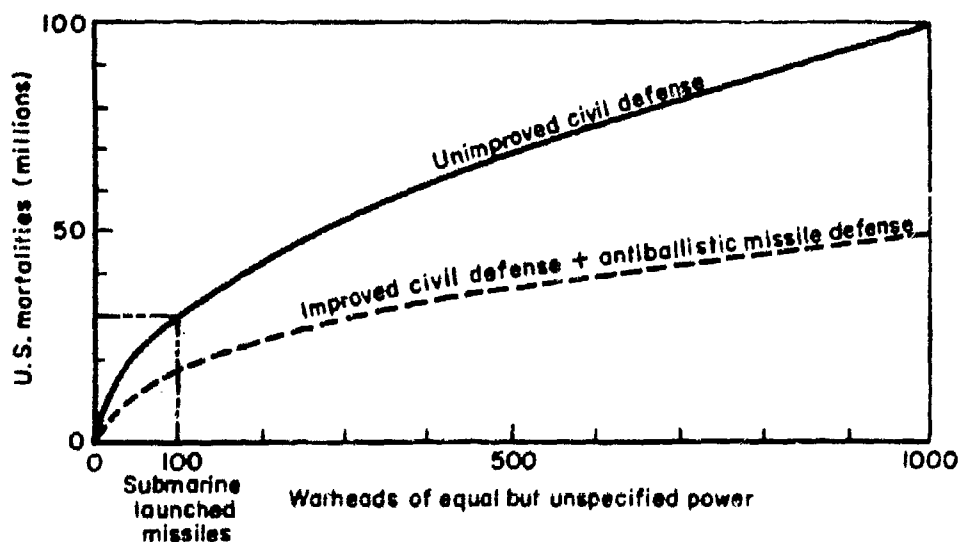


Fig.1—U.S. mortalities versus enemy warheads on target

The upper curve in Figure 1 presupposes a hypothetical military posture in which an enemy has the delivery systems, intercontinental ballistic missiles, submarine launched ballistic missiles, and bombers to lay down on targets in the United States an aggregate of 1,000 warheads of equal but unspecified explosive power. Depending upon the power attributed to the warheads, their selection of targets, and modes of weapon delivery, any number of U.S. mortality curves can be derived, but the upper curve adequately illustrates some points that need to be made about damage-limiting and counterforce thinking.*

The salient feature of the upper curve in Figure 1 is that population losses rise so sharply with the first few weapons delivered, owing to the vast power of individual nuclear weapons, the high concentration of U.S. population in urban areas, and the presumed limitations of anti-ballistic missile defenses. These are not conclusions; rather, they are the input factors that produce the curve. The curve is simply a graphic statement of these factors. If national leaders are ever called on to decide whether to launch or not to launch a preemptive counterforce strike, the gruesome costs that some such curve indicated would be uppermost in their minds.

* In a statement to Congress on 1961, Norman A. Hanunian of The RAND Corporation presented illustrative charts indicating that a Soviet strike of 300 to 3000 megatons against U.S. military facilities could kill from 10 to 45 percent of our population. For countercity strikes, Mr. Hanunian's estimates were substantially higher. (See Norman A. Hanunian, The Relation of U.S. Fallout Casualties to U.S. and Soviet Options, The RAND Corporation, P-2412, August 18, 1961.

There are two ways, offensive and defensive, to reduce the enemy potential to inflict damage on the United States -- first, to knock out by counterforce attack enemy missiles and other systems that would deliver the warheads before they could leave their bases, and second, to reduce the vulnerability of our society through improvements in passive defenses and by developing effective antimissile defense systems. The first would curtail the enemy's capability by reducing the number of warheads that he could throw at us. The second would reshape the curve and reduce the enemy's damage potential at every point along it as suggested by the lower curve of Figure 1. This illustrates the hypothetical result of an unquantified major program to "harden" our society and improve its defenses. When the quantities are estimated by research, the resultant curve is a cogent argument for civil defense preparations.

Little is said about civil defense in this paper, though only because to do so would interfere with the heuristic argument. In fact, the bulk of the improvement in the lower curve of Figure 1 derives from shelter and other civil defense preparations rather than from ABM. Our disinterest in comparatively low cost civil defense and shelter programs seem paradoxically opposed to American fascination with comparatively high cost anti-ballistic missile defense. The need for either is a real or psychic response to a perceived threat -- the possibility of a nuclear strike on the United States, however remote. One explanation is that development of ABM can be left to big government. With shelters and much other civil defense work, the individual or at least the local government

is involved in action. Again, ABM development stirs our national competitive spirit. Americans tend to feel that anything the opponent can do, we can match or improve upon. Perhaps most important, ABM is positive rather than negative in nature. Civil defense implies diving into a hole while the world disintegrates over your head: ABM implies prevention of such damage and avoidance of such degrading behavior.

At this point it becomes necessary to complicate the counterforce problem by addressing the question of enemy strategic forces that may be invulnerable to our counterforce operations -- notably ballistic missiles, launched from submarines at sea. The box at the lower left corner of Figure 1 suggests that a hundred such missiles could kill approximately 30 million Americans.

Invulnerability of a portion of the opponent's nuclear forces, as indicated in this graph, limits the efficacy of counterforce. Even though submarines and their missiles may not be forever invulnerable -- as suggested by the history of arms development -- they may remain so in the short run. The net effect is to restrict counterforce operations, in the damage-limiting sense, to attempts to reduce the enemy potential for inflicting damage from the maximum of 100 million to the 30 million level. That is, a perfect counterforce strike in this hypothetical context would still leave the enemy with the capacity to inflict some 30 million deaths upon our relatively unsheltered society -- assuming the enemy to have the capability to launch 100 ballistic missiles from submarines.

Now the thought of 30 million U.S. dead stuns and horrifies. But 100 million or more U.S. dead is even harder to conceive. These hardly seem to be real alternatives. Consequently, even the most coldly rational U.S. leader might find himself unable to risk the loss of millions of U.S. lives in order to undertake a counterforce first strike unless the only conceivable alternative was to submit to the full weight of an enemy countervalue strike entailing a much greater loss of U.S. lives.

The necessities of the present deterrence policy, however, seem to require that the counterforce threat be posed. Not to do so would invite the opponent to explore the full limits of his position. It is a familiar but pertinent point that Soviet caution has been enhanced by our deterrent posture. If the effectiveness of the deterrent declines, the Soviet leadership may reconsider the necessity for caution.

It is relevant to note here that the efficacy of counterforce depends to a considerable extent upon striking first. In contrast, the countervalue strike hardly depends at all on striking first. In fact, an important deterrent potential of the second strike capability is realized if the opponent believes retaliation will be directed against his cities.

To pose the threat of a first strike and to minimize the risk of countervalue retaliation, much counterforce thinking emphasizes damage avoidance. The counterforce strike, it is said, should be designed to take out the enemy's damage-inflicting potential with minimal harm to the enemy society. A collateral assumption underlying some counterforce thinking at its present stage of development

is that, by minimizing the harm done him, the opponent will feel less strongly impelled to retaliate. If anything, he will be almost as deterred after the counterforce strike as before -- partly for fear of sustaining even greater damage of a punitive kind, and partly because the residual forces at his disposal will be much smaller.

Technical considerations weigh heavily in an appraisal of what counterforce can and cannot do. The salient factors are reliability, accuracy, and warhead power as measured against the vulnerability of the enemy target system, the location and vulnerability of which is assumed to be known. Starting with, say 1000 missiles with a reliability of only fifty per cent -- unrealistically low but mathematically convenient, we can count on 500 missiles for the first strike mission. Let us assume that each missile has a Circular Error Probable (CEP) of one mile, which means that half of the missiles should strike within one mile of the target. If the hypothetical target is such that it can only be destroyed by a warhead of a given size exploding within one mile, simple mathematics suggests that the military planner should "program" more than one reliable missile against each such enemy target. The programming of a second missile against a given target under these conditions, however, only raises the probability of kill from 50 percent to 75 percent. The military planner is caught with a situation of diminishing marginal returns, i.e., each additional missile increases the probability of kill only half as much as did the previous additional missile. Our 1000 missile initial force can thus be counted on to destroy 250 of 500 targets aimed at, 188 of 250 targets, or 146 of 167 targets, using one, two, or three missiles

respectively for each target. In the circumstances, mathematically guaranteed kill of any given target is unattainable.

Ensuring the success of a missile strike requires first of all a knowledge of the location and vulnerability of the opponent's forces. It is also closely constrained by mathematical probability calculations, which are themselves very sensitive to assumptions about reliability, accuracy, and warhead power. The "trade-offs" among these various factors are important. Greater reliability of missiles means more targets destroyed, or the same number destroyed with smaller warheads, or the same number of even "harder" targets destroyed, or the same destruction capability with fewer missiles in the arsenal, or the same destruction capability with more missiles held back for follow-on strikes. Greater accuracy similarly improves the outcome as does any assumption that increases the vulnerability of the enemy targets or increases warhead power. The last-named, however, while reducing the necessity for accuracy, steps up collateral damage, in itself undesirable in a purely counterforce operation.

Obviously, these factors are not static but constantly changing. The rough conclusion that emerges is that to undertake a counterforce operation with a high degree of confidence we need several times as many missiles of a given reliability, accuracy, and yield as the enemy has targets of a given hardness.

To complicate the picture still further, the target system is not made up of so-called hard targets alone. A typical postulation might give an enemy 100 "invulnerable" missiles at sea, 100 "hard" missile sites on land, 300

"soft" missile sites, and 50 "soft" aircraft bases, from which attacks might be launched at us. We could direct our entire force against 100 enemy hard sites, for example, only to find that the inexorable mathematics of probability precludes the assured destruction of all of these.

An alternative with obviously greater damage-limiting potential, assuming we start with 1000 missiles, and with the previously suggested reliabilities, accuracies, and warhead explosive powers, would be to lay down 350 of the 500 missiles that can be relied upon to take off against enemy soft targets and send the most accurate 150 missiles against enemy hard targets. This, of course, grossly oversimplifies a very complicated military planning problem, but it does suggest the nature of the choices that would have to be made.

In any case, a reasonable approximation of this "gaming" operation would leave the opponent with something like 100 warhead equivalents by land, another 100 by sea, or a damage potential, reading from our hypothetical curve in Figure 1, of approximately 45 million U.S. lives. This appalling possibility would dictate the use of more precise tools of war if counterforce is to be more than marginally effective, not to mention the even more pressing need for a solution to the threat of submarine-launched missiles.

It is held that these more precise tools are bomber aircraft, which display greater reliability, greater flexibility, appreciably better accuracies, and have the special advantage of being able to take a close look at the target. Bombers are, however, appreciably slower in getting to target, give unmistakable warning of the attack, and are vulnerable to enemy air defenses.

enemy hold his retaliatory attack until our missiles strike home? Will he await bomber follow-on attacks? Can we maintain sufficient numbers of missiles and bomber aircraft to ensure satisfactory counterforce outcomes? Can accuracies, reliabilities, and flexibilities be improved for better counterforce results? Will enemy targets become too hard, mobile, or concealed for the counterforce strategy to remain effective, or can new, flexible, "hunt and kill" weapon systems maintain the margin of advantage for offensive counterforce operations?

In conclusion, it can be said that although the analysis suggests severe limitations upon the efficacy of counterforce strategy, the necessity for a counterforce capability may always be with us, if only because the first strike may have so important an effect upon the outcome of a war. Since the value of a counterforce capability rises as defensive damage-limiting measures are adopted, the two closely complement one another. The close interdependence of offensive (counterforce) and defensive (society-hardening) capabilities may in fact give direction to political-economic choices of the future. Clearly, the role of defensive damage-limiting measures grows in importance with increases in enemy strategic hardness and decreases in his reaction time.

The relationship of counterforce and damage-limiting to a policy of deterrence can be summed up quite simply, at least in theory. Deterrence is essentially a threat relationship. Deterrence of the widest range of enemy aggressive actions is provided by a credible capability to strike first. Today, this is tantamount to a counterforce strategy. The credibility of a counterforce posture is

in turn enhanced by conspicuous damage-limiting measures and particularly by defensive measures that make nuclear interchange outcomes less "unthinkable" even under the least favorable conditions. To the extent that this can be buttressed by second strike retaliatory capabilities that guarantee overwhelming punishment of the aggressor in the event of a surprise, preventive, or preemptive attack, deterrence policy can continue to play a key role in safeguarding our society.

Finally, looking beyond the data of the analysis, the psychological and political attractions of certain strategies and certain capabilities may in the end prove more important than any rational, strategic calculus. Great political utility may derive from being able to feel that, in a crisis, our forces are obviously stronger than those of a potential enemy. Then too, the strategic dilemma itself -- the need to maintain forces the use of which would represent a failure of all aspirations -- imposes psychological and political imperatives that will push decision-makers toward improvements in both counterforce and damage-limiting capabilities.